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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,700	01/15/2004	Tomohiro Makigaki	9319T-000638	4969

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EXAMINER	
TRA, TUYEN Q	
ART UNIT	PAPER NUMBER
2873	

DATE MAILED: 12/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/758,700	MAKIGAKI, TOMOHIRO	
	Examiner	Art Unit	
	Tuyen Q Tra	2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *0104 and 0604*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 4 recites the limitation "the bottom face" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Claim 14 introduces a new " a movable reflective film" which is not distinguish from previous "said movable film". An appropriate correction is needed.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3, 5-12 and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Yokoyama et al. (U.S. Pat. 6,094,294A).

a) With respect to claims 1 and 13, Yokoyama et al. discloses a optical modulator device, display and electronic apparatus in figures 4 and 7 and method thereof comprising of a first substrate (item 10d) having a movable reflective film (item 15d) that oscillates in accordance with the application of an electrostatic force; a light-transmitting second substrate (item 20) disposed so as to oppose the first substrate (10d) and formed with a transparent electrode (item 27) for applying the electrostatic force, in a position corresponding to the movable reflective film (15d); and a cavity section, demarcated by the first substrate (10d) and the second substrate (20), for restricting the range of oscillation of the movable reflective film (15d).

b) With respect to claims 2 and 3, Yokoyama et al. further discloses wherein the cavity section for restricting the range of oscillation of the movable reflective film is constituted by a recess section or groove section provided in the second substrate, and a flat face of the first substrate, the movable reflective film being formed in a position of the first substrate corresponding to an opening of the recess section or groove section in the second substrate; wherein the cavity section for restricting the range of oscillation of the movable reflective film is constituted by a recess section or groove section provided in the first substrate, and a flat face of the second substrate, the movable reflective film being formed on the face of the recess section or groove section in the first substrate (see Figure 7).

c) With respect to claim 5-12, Yokoyama et al. further discloses wherein the movable reflective film (15d) is formed from either a conductive film; wherein the first substrate (10d) is formed from a silicon semiconductor substrate of one polarity, and the movable reflective film (15d) is formed from a semiconductor film of the other polarity; wherein the first substrate (10d) and the second substrate (20) are bonded together by anodic bonding; wherein the second substrate (20) is made of borosilicate glass; wherein a light absorber is formed on the upper face of the transparent electrode; wherein the optical modulator is a display device.

d) With respect to claims 14 and 15, Yokoyama et al. further discloses step for forming an etching prevention film (11, Fig. 2) by doping an impurity into the region on one side of a semiconductor substrate on which said movable reflective film (14) is to be formed, and forming a movable reflective film (14) by performing etching of said semiconductor substrate (10, Fig. 2) from the other side of said semiconductor substrate until said etching preventing film (11), and making said etching prevention film oscillatable.

4. Claims 4 and 17-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Kowarz (U.S. Pat. 6,307,663B1).

a) With respect to claim 4, Kowarz discloses a optical modulator device, display and electronic apparatus in figures 4 and 7 comprising of a first substrate (item 18) having, on one face thereof, a plurality of first grooves (items 5a, 5b), each having a movable reflective film (item 22) that oscillates in accordance with electrostatic force formed on a bottom face thereof; and a light-transmitting second substrate (item 10), positioned so as to oppose the first substrate (18), having a plurality of second grooves (item 27) provided on the face thereof opposing the first substrate (10d), each of the second grooves (27) extending in a direction orthogonal to the first grooves (5a, 5b) and having a transparent electrode (item 29) formed on the bottom face thereof.

b) With respect to claims 17-24, Kowarz further discloses wherein the movable reflective film (22) is formed from either a conductive film; wherein the first substrate (18) is formed from a silicon semiconductor substrate of one polarity, and the movable reflective film (22) is formed from a semiconductor film of the other polarity; wherein the first substrate (18) and the second substrate (10) are bonded together by anodic bonding; wherein the second substrate (10) is made of borosilicate glass; wherein a light absorber is formed on the upper face of the transparent electrode; wherein the optical modulator is a display device.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made

to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yokoyama et al. (U.S. Pat. 6,094,294A), as applied to claim 13 above, in view of Kowarz (U.S. Pat. 6,307,663B1).

Yokoyama et al. disclose broad step for forming first substrate, forming second substrate, bonding the first and second substrates together. However, Yokoyama et al. does not disclose steps for forming a recess section by patterning a transparent substrate (10), forming a transparent electrode film inside the recess section of the transparent electrode, and forming an absorbing film on the transparent electrode film inside the recess section of said transparent substrate. Within the same field of endeavor, Kowarz et al. discloses step for forming a recess section by patterning a transparent substrate (10), forming a transparent electrode film inside the recess section of the transparent electrode, and forming an absorbing film on the transparent electrode film inside the recess section of said transparent substrate (fig. 1).

It would have been obvious, therefore, at the time the invention was made to a person having skill in the art to construct steps for forming first substrate, second substrate and bonding them together such as disclosed by Yokoyama et al., and with step for forming second substrate comprising of steps for forming a recess section by patterning a transparent substrate (10), forming a transparent electrode film inside the recess section of the transparent electrode, and forming an absorbing film on the transparent electrode film inside the recess section of said transparent substrate such as discloses by Kowarz , for purpose of forming the optical modulator.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Huibers et al.(US Patent 6,172,797 B1) discloses a double substrate reflective spatial light modulator with self-limiting micro-mechanical elements in Fig.3A with teaching of limitations of claim 1 and 4 in which a first substrate (20) having reflective film (48), a second substrate comprised of electrodes (46) formed a cavity with the first substrate, the reflective film (48) oscillated within the cavity.

b) Little et al. (US Patent 6,747,784) disclose a compliant mechanism and method of forming same in figure 2 with teaching of reflective film (420) formed on first substrate (115), second substrate (230) and electrodes (240, 220).

c) Murakami et al. (US Patent 6747786 B2) discloses an optical deflector and optical deflector array in Figures 2 and 3C comprising of a first substrate (74), a reflective film (50) formed on the first substrate (74), a plurality of recesses (trend) on second substrate (40), electrodes formed on the second substrate (40).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuyen Tra whose telephone number is (571) 272-2343. The examiner can normally be reached on Monday to Thursday from 8:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps, can be reached on (571) 272 - 2328. The fax number for this Group is (703) 872-9306.

tt

November 3, 2004

Hung Xuan Dang
Primary Examiner